

TITLE OF THE INVENTION

PORABLE TERMINAL

FIELD OF THE INVENTION

This invention relates to a portable terminal, such as, for example, a portable telephone, PHS, PDA (Personal Digital Assistant), PCS (Personal Communication Service), PC (Personal Computer) and so on on the like.

BACKGROUND OF THE INVENTION

In these recent years, in a foldable portable terminal, such a terminal that has been developed, in which, in addition to an LCD (main liquid crystal) which was is formed on a front surface of at the housing, an LCD (sub liquid crystal), which is usable even in a folded state, is was formed on at the back surface thereof has been developed. In addition, the The front surface of the portable terminal is a surface which is exposed in a state that when the foldable portable telephone was is opened state, and the back surface thereof is a surface which is exposed when the portable terminal is in at the folded state (closed state), and being a surface of a back on the opposite side off from the front surface.

As suchlike-publicly known examples of a foldable portable terminal, JP-A-2000-253113 gazette and JP-A-2002-111816 gazette can be cited.

In the JP-A-2000-253113 gazette, disclosed is such terminal a structure that in which, in addition to the main liquid crystal display which was is formed on the front

surface of the terminal device, a see-through liquid crystal display is disposed in an other housing, and so that, even when the portable terminal is in a folded state, information displayed on the main liquid crystal is display can be viewed through the see-through liquid crystal display. Also, in order to realize a predetermined operation when the portable terminal is in a folded state, disclosed is such a structure that a shutter key, a mode switching key, and a menu key were are disposed on the housing.

Also, in the portable telephone disclosed in JP-A-2002-111816 gazette, in order to enable an audio operation when the portable telephone is in the folded state, disclosed is a the portable telephone in which, disposed was has an operation key that is disposed so as to be usable when the portable telephone is in a folded state along with the sub liquid crystal display.

On one the other hand, in a JP-A-2001-186396 gazette, disclosed is a terminal structure in which is not one wherein liquid crystal display parts were are formed on both surfaces of a front surface and a back surface of the portable terminal, but, which only a main liquid crystal display is provided on the front surface. Thus, in order to make it usable even in such a state that possible to view the main liquid crystal display formed on the front surface was even when the portable terminal is folded, enabled folding the housings are hinged so as to be foldable also toward an opposite side to at the normally folded side so as for to allow the main liquid crystal display to be exposed even when the terminal is in the folded state.

In the same manner, in a JP-A-2001-320463 gazette, disclosed is a structure in which makes the main it usable by having the main liquid crystal display is exposed in even when the portable terminal is in the folded state, by folding after effecting 180

degree rotation of the housing thereof around a hinge part rotating in the horizontal direction the housing, on the front surface of which, the main liquid crystal was display panel is formed, against a hinge part.

SUMMARY OF THE INVENTION

However, in the portable terminal disclosed in JP-A-2000-253113 gazette, there is such a disclosure that a predetermined function can be utilized when the terminal is in a folded state, but as to keys which were are formed on the back surface thereof, such as the shutter key, the mode switching key and so on, these keys are disposed in a mixed manner, and so that the usability of a camera operation when the portable terminal is in a closed state has not been studied sufficiently. For example, in case of operating the shutter key, there was is a possibility that the mode switching key is will be mistakenly operated. Also, the mode switching key is a key which is not necessary to be operated in the middle of the camera operation; and so, because of the existence of the suchlike key, it is necessary for a use user to remember too much, or to make too many judgments too much, as to which key is for which function, and it could not be said that whereby the usability is not sufficient.

Also, in the portable terminal disclosed in JP-A-2002-111816 gazette, disclosed is simply one by which a user can listen to music data and so on when the portable terminal is in the closed state, and but there is no description regarding a camera operation in the closed state, and studies of an the arrangement and usability of operation keys at the time of the camera operation and so on were not sufficient.

Also, in the JP-A-2001-186396 gazette and the JP-A-2001-320463 gazette, both

ef them disclose a structure which is usable in such a state that in which the main liquid crystal display formed on the front surface is exposed when the portable terminal is in the folded state, but this simply relates to the use of the main liquid crystal display and does not relate to the a sub liquid crystal display which was is formed on the back surface. Also, in the case of these portable terminals, in order to have the main liquid crystal exposed, unlike at the folded state in case of in which the portable terminal is normally carrying carried around (the folded (closed) state in this embodiment), there was a necessity to take the trouble to have the housing reversed or rotated.

In this manner, in any one of publicly known examples, a sufficient study has not been carried out as to the usability of the camera operation when the portable terminal is in the closed state, in the a foldable portable telephone having display parts on both the front and back surfaces thereof. In particular, a sufficient study was has not been conducted as to the key layout with good usability in case of operating a camera by gripping a portable telephone with in the closed state in such a manner that the hinge part is in at an upper side.

Also, a sufficient study was has not been conducted as to the usability of the portable terminal on the occasion that when it was is changed from a closed state to an opened state, or from the an opened state to the closed state.

Also, in any one of the publicly known examples, a sufficient study is has not been conducted as to a structure for preventing a wrong operation and which may cause a malfunction in case that keys were are disposed on the back surface of the portable terminal.

A first object of this invention is to realize an improvement in the of usability of

the portable terminal in the folded state, particularly in the case of a foldable portable telephone. In particular, it is an object to improve the usability of the portable terminal at the time of camera operation.

Also, a second object of the invention is to prevent a wrong operation of ~~the~~an operation key which ~~was~~is formed on the back surface of the portable terminal.

Also, a third object of the invention is to prevent a malfunction of ~~the~~an operation key which ~~was~~is formed on the back surface of the portable terminal.

The invention may be configured as described in appended claims, in order to accomplish the above-described first to third objects.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention, together with further advantages thereof, may best be understood by reference to the following description, taken in conjunction with the accompanying drawings, in which:

Figs. 1-(1) to 1(4) provide plan and side views showing a first embodiment of ~~is-a~~ conspectus view of a portable telephone of a first embodiment in both open and closed states;

Fig. 2 is a structural-block diagram of the first embodiment;

Fig. 3 is a process flow chart of the first embodiment;

Fig. 4 is a diagram showing a storage format table of pickup image information as used in the first embodiment;

Fig. 5 is a functional flow diagram which shows an example of a display screen of the first embodiment;

Fig. 6 is a process flow chart of a second embodiment;

Fig. 7 is a functional flow diagram which shows an example of a display screen of the second embodiment;

Fig. 8 is a process flow chart of a third embodiment;

Fig. 9 is a functional flow diagram which shows an example of a display screen of the third embodiment;

Figs. 10(1) is a diagram and Figs. 10(2) to 10(4) are is-a-process flow chart-s of a fourth embodiment;

Fig. 11 is a functional flow diagram which shows an example of a display screen of the fourth embodiment;

Figs. 12(1) and 12(2) are diagrams which shows an example of a layout of a sub operation key 107;

Figs. 13(1) and 13(2) are diagrams is-a-view showing a-an example of the shape of the sub operation key and a cross-section of the terminal unit, and Fig. 13(3) is a cross-sectional view taken along line y-y in Fig. 13(1);

Fig. 14 is a functional flow diagram which shows an example of display screen transition of a sub display part 104 at the time of a normal state other than a camera mode; and

Figs. 15(1) to 15(3) are diagrams of various types of is-a-view explaining a definition of a back surface or a side surface of a housing.

DETAILED DESCRIPTION OF THE EMBODIMENTS

Hereinafter, various embodiments of this invention will be described by use of

with reference to the drawings. In addition, in the following drawings, the same reference numerals are used to indicate and identify the same structural parts.

Figs. 1(1) to 1(4) shows a conspectus view of a portable telephone which represents this embodiment (first embodiment), and Fig. 2 is a structural block diagram of the portable telephone according to this embodiment. AlsoMore particularly, Fig. 1(1) shows a front view of the housing, and as it appears when the portable telephone is in the open state; Fig. 1(2) shows a view of the housing which was viewed in the open state as seen from a the back surface thereof; and Fig. 1(3) shows a side view of the housing which was viewed from a side surface thereof, as it appears when the portable telephone is in a folded state; and Fig. 1(4) shows a back view of the housing in a the folded state, respectively.

Here, in this embodiment, the illustrated directions of left and right, as well as up and down, are defined in a state of taking a look at a when viewing the portable terminal from a front surface thereof, as shown in Fig. 1(1).

Also, a the front surface of the housing, which configures the portable telephone in this specification, is defined to be of that surface which is in a range of vision from a front surface in such a state that when the portable telephone was-is in the opened state, as shown in Fig. 1(1), and; a back surface thereof is defined to be of that surface which is in a range of vision from a back surface of the front surface in such a state that when the portable telephone was-is in the opened state, as shown in Fig. 1(2); and a side surface thereof is defined to be of that surface which is in a range of vision other than the above-described ones.

In this regard, however, in a current portable telephone, a streamline shaped

housing is adopted, and so there are quite a lot large number of portable telephones in which a boundary line between the front surface, the back surface and the side surface is not clear. For example, as shown in Fig. 15(1), in a portable telephone in which the side surface is disposed at approximately 90 degrees to a reference or base surface, by the above-described definitions, it is easily determined that a easy to distinguish between the front surface is of a range of vision from a front surface in such a state that the portable telephone was opened, and a and the back surface, on the one hand is of a range of vision from a back surface of the front surface in such a state that the portable telephone was opened, and a the side surface is of a range other than the above- described ones, on the other hand, in the open state of the portable telephone.

—However, as shown in Fig. 15(2), when there is no distinct surface which is disposed approximately 90 degrees to the reference surface is not clear, all surfaces can be viewed from the front surface and the back surface, and also so that, a boundary line between the front surface and the back surface is not clear.

In this connection, even in a case as described above, if it was determined is indicated that an operation key which was is disposed so as to straddle a joint part for joining joining an upper side member and a lower side member of a housing (e.g., an operation key B of Fig. 15(2) etc.), even if the operation key can be viewed from the front surface or the back surface, it is deemed to be disposed on the side surface.

Also, as shown in Fig. 15(3), which shows an example of a cross sectional view wherein a housing 200 is cut in a surface along a line x-x parallel to a hinge part 300, as seen in Fig. 1(1), even in the case of an operation key which was can be viewed from a back surface of the housing 200 and is disposed at a position which does not straddle

the above-described joint part, it was has been determined that, if an angle (α) which is formed by a normal line direction of a located position of the operation key relative to a housing surface and a vertical direction in a grounded state of the portable telephone is 45 degrees and more, if the operation key is deemed to be disposed on a side surface. That is, it was determined that, based depending upon a fact that whether the located position of the operation key is close closer to either of the back surface or the side surface, it is judged determines whether it is disposed on the back surface or on the side surface.

On one the other hand, if it is possible to deem consider that the housings 200, 201 are of constitute an approximately 6 face piece, the front surface, the back surface and the side surface may be defined on the basis of the an approximately 6 face piece.

In addition, in each case, in a use the state of use wherein the housing was is being held, for example, whether it is a range of where an operation key is operable by a use of the thumb, or whether it is in a range which is makes it difficult to be mistakenly operated, becomes a standard for determining a boundary line of each surface.

Now, the portable telephone shown in Figs. 1(1) to 1(4) and 2 of this embodiment, by which exhibits an improved usability at the time of being the device is used in the folded was state improved, will be described. The portable telephone of this embodiment has two housings 200 and 201, which can be moved to opened and closed states, and an image pickup part, for example, an image pickup camera 109. These housings 200 and 201 are joined so that they of a structure which can be folded around an X-X axis as a turning axis, and, for this purpose, they are connected to each other at a hinge part 300.

The housing 200 has a speaker 111-112 which outputs a sound at the time of telephone communication and a main display part 103 which conducts produces a main display; and, it has, on a back surface of, opposite to the main display part 103, a sub display part 104 which conducts produces a simplified display. There is also and a sub operation key 107 (in Fig. 1(2), 107a and 107b) on the back surface. Here, on the main display part 103, displayeds are not only the operating states, such as at the power state, an the electromagnetic wave strength, at the power, at the server connection state, unread mails and so on, of the portable telephone, but also received data, such as the telephone number inputted, a mail address, a mail sending text and soon, and as well as a motion picture and a still picture, a telephone number of a caller at the time when an incoming call was received, a received mail text, a screen of Internet connected data and so on. On the other hand, sub display part 104, displayeds are the operating states of the portable telephone; and, for example, icons are displayed which show at the power state, an the electromagnetic wave strength, at the power, a server connection state, and unread mails are displayed. Also, on the main display part 103 and the sub display part 104, it is possible to display (monitor) information of an image which was picked up by the image pickup camera 109 as a view finder at the time of camera operation.

Also, it the back surface has a music speaker 113, which is used for reproducing a melody for signaling an incoming call, and for playing a music file, such as mp3 etc.

On one the other hand, the housing 201 has a main operation key keyboard 106 by which a main input operation is carried out, and a microphone 112-111 through which a sound is inputted, and a side-mounted mode selection key 105 for switching

image pickup modes of the image pick up camera is disposed thereon. Here, the main operation keyboard 106 is an input partdevice used for inputting a telephone number and other information; and, when the portable terminal is used as a typical telephone, it is used for inputting the telephone number of the other party, and while in the case of sending a mail etc., character information etc. is inputted through it.

Also, the mode selection key 105 is, for example, a key that is used for switching between modes, such as a motion picture mode for taking a motion picture, a still picture mode for taking a still picture, a setting mode for carrying out various settings for image pickup, a browsing mode for browsing through pictures which were imagewere previously-picked up, an edit mode for editing pictures which were image- previously picked up, and so on. In addition, in this embodiment, ~~formed~~ is a slide key is provided which is slid in upward and downward directions, although ~~but~~ a dial type key, such as jog dial etc., may be provided as well~~formed~~. In addition~~this~~ regard, ~~it is configured that~~ the slide key can select the motion picture mode bywhen being slid in the upward direction for a predetermined period of time, and can select the still picture mode bywhen being slid in the downward direction for a predetermined period of time.

Referring to Fig. 2, the CPU 110 operates on the basis of a program which was-is stored in a memory 102, and it controls each part of the portable telephone in response to an input from the main operation key keyboard 106 and the sub operation keys 107.

—A power supply part 114 is provided in the form of a battery for driving each component part of the portable telephone.

A fold detection part 108 detects a folding the open or closed state of the portable telephone, and. In this regard, for example, the housing 200 has a magnet

and the housing 201 has a hall-effect device, and so that opening and closing states are detected on the basis of a Hi level or a Low level of the voltage value of the hall-effect device to which magnetic fields were applied by the magnet. In addition On the other hand, the fold detection part 108 may be one-a device which made makes use of a sensor or an engagement of a concavity and a convexity, if whereby the opening and closing states can be detected.

Also, disposed is the memory 102 which stores various data, for example, data and so on of motion pictures and still pictures, and the memory 102 is composed of a volatile memory 102a for storing data temporarily and a non-volatile memory 102b for holding a stored state regardless of the ON/OFF state of a-the power supply.

Also, disposed there is a communication part 101, and through this communication part 101, it becomes possible to use a function for communicating communicate with a switching machine and a server, and as well as to perform a GPS (Global Positioning System) function.

In addition, disposed in the approximately center of the hinge part 300, which connects the housing 200 and the housing 201, disposed there is the image pickup camera 109, which can be turned separately from the housings 200 and 201, and by means of this image pickup camera 109, image pickup of a motion picture and a still picture is conducted can be carried out.

In the above-described portable telephone, according to of this embodiment, it is tried possible to improve the usability of the portable telephone in the closed state by forming providing the sub operation key 107 together with the sub display part 104 on the back surface thereof. In particular, it is possible to improve the usability of the

device, including the camera operation and so on.

Here, the sub operation key 107, which was has been disposed so as to improve the operability of the portable terminal when it is in the closed state, and in particular, the operability inthereof during camera shooting, will be described in more details.

We studied conducted a study as to determine for which function out of camera shooting functions an exclusive use key is prepared for should be provided, on the occasion of carrying out camera shooting in a state that when the portable terminal was is closed. And, we determined that at least, an activation key for activating a camera function, a shutter key for instructing at the start of shooting of image information, a zoom adjustment key for adjusting at the size of the image information to be taken and a mode selection key for selecting a mode of between a motion picture mode or a still picture mode, are prepared needed as exclusive use keys. In addition, although the an activation key and the a mode selection key are not necessarily required, by preparing providing them as exclusive use keys, it becomes possible to set a camera mode with the portable terminal in a folded state as it is, without opening the portable terminal. On that account, it becomes effective at the time of quick camera shooting and so on.

Next, we studied a layout of these keys. It is fine if each key is usable in the folded state, but it is impossible to secure sufficient operability and usability of the keys simply by disposing them on the same surface.

On one hand, we are of the thought have considered that, to make use of the sub display part 104 that is formed on the back surface as a view finder when the portable terminal is in the closed state and to operate in a state of holding the portable telephone while holding it in such a manner that the keys are can be depressed by a the thumb

~~are stable provides stability~~ in case of camera shooting, and ~~allowing~~ sufficient usability can ~~to~~ be secured; and ~~so~~, judging from that view point, it becomes desirable to dispose the above-described exclusive use keys on the back surface of the portable telephone.

However, the portable telephone is normally of a small size and has the sub display part 104 on the back surface so that ~~at the~~ regions thereof is limited; and, if the above-described ~~four~~ 4 keys are all disposed thereon, one key may come close to ~~another the other key and a~~, causing the size of a key itself is to be limited, so that it becomes easy to be operated the key mistakenly. For example, when the shutter key is intended to be depressed ~~but~~, the activation key or the mode selection key ~~is~~ may be mistakenly depressed, and as a result of which, the portable telephone undesirably returns to an initial camera shooting state and is switched from the still picture mode to the motion picture mode, so that it becomes impossible to take ~~an~~ the image which is wished-intended to be taken.

Therefore, ~~we made such a~~ the structure of the portable telephone of this embodiment was designed so that a camera function setting key and an shooting time operation key are disposed without mixing them in the same plane. Here, the camera function setting key is an operation key for conducting setting of ~~at the~~ camera function prior to shooting, such as the activation key, the mode selection key and so on. And, the shooting time operation key is, after a key, the camera function such as a zoom key, the shutter key and so on, to be used after the camera function was activated; or, in case that a shooting mode of a motion picture or a still picture can be selected, it serves as an operation key for carrying out the camera operation during a period after the mode

was selected until shooting is completed.

Furthermore, we, on the basis thinking that the camera function setting key is essentially a key which ~~is sufficient to~~ ~~probably will~~ be used only once at the beginning of operation and the shooting time operation key is a key which is handled a number of times during a period of shooting, we determined decided to form provide the shooting time operation key on the back surface and to ~~form dispose~~ the camera function setting key on the side surface. The reason that why the shooting time operation key was formed on the back surface is, as described above, that operability on the occasion of utilizing the sub display part 104 formed on the back surface as a view finder is good, and that it is possible to depress (operate) a key stably ~~by using the~~ thumb in the state that in which the portable telephone ~~was~~ is being held. Also, the reason that why the camera function setting key was formed on the side surface is, on the occasion of operating the zoom key and the shutter key, to prevent them from being mistakenly operated by the thumb.

In addition, if the shooting time operation key is disposed on the side surface of the housing 200 or the housing 201, the finger used for operating the shooting time operation key differs between the case that where the housings ~~were~~ are held by the right hand and the case that where the housings ~~were~~ is held by the left hand (e.g., the thumb is used in case of the right hand, and an index finger is used in case of the left hand); and, therefore, if ~~it was this key is~~ disposed on the back surface of the housing 200 or the housing 201, it is possible to conduct a similar operation between the case that situation where the housings ~~were~~ are held by the right hand and the case that situation where the housings ~~were~~ are held by the left hand, i.e., an operation by

at the thumb is possible in each case, so that the usability is good improved.

The shooting time operation key carries out only a function which was that has been assigned in advance. It may be formed on the back surface as an exclusive use key but; however, taking a series of operations which become necessary at the time of camera operation into consideration, it is configured by use of such software such that a key function is displayed on a sub display screen, and a when the key which corresponds to that display is selected so that a, the displayed function is carried out, and it is configured such that the shooting which one wants is completed over changing the screen. ByIn this way, since a key which was-is formed on the back surface is not occupied restricted to simply with one function, even in a normal standby state, other than the time of camera operation, it is possible to realize ether another function by use of that key. A detailed embodiment thereof will be described later.

As described above, the shooting time operation key is, like the sub operation keys 107a and 107b of Fig. 1(4), is disposed on the back surface of the housing 200, and the camera function setting key (the mode selection key 105 seen in Fig. 1(4)) is disposed on the side surface of the housing 201, without mixing interfering with the shooting time operation key; and, thereby, it is possible to prevent such a wrong operation that in which the camera function setting key, instead of the shooting time operation key, is depressed by mistake, and. In addition, it is possible to easily operate by a the keys with the thumb, which is the easiest way to bring the necessary pressure out of the five fingers ever while stabilizing the housings by supporting them by a in the palm of a the hand. and in addition, it is This also makes it possible to conduct camera shooting without few blurring, so that the usability is improved.

In addition, the shooting time operation key is a key which is used after the camera function ~~was-has been~~ activated and a shooting mode, such as a motion picture mode or a still picture mode, ~~was-has been~~ selected until the shooting is completed, and b. Besides the shutter key, for example, a focus adjustment key for adjusting focus, a shutter speed adjustment key for adjusting shutter speed, a brightness adjustment key for adjusting the brightness of the image information, or a change key for changing athe display screen during a period of camera shooting and so on may be used.

Also, even in a case that it-where the portable terminal is configured to accept an input of the camera function setting key, such as the activation key, the mode selection key and so on, after the camera function ~~was-has been~~ activated and the shooting mode, such as the motion picture mode, the still picture mode and so on, ~~was-has been~~ selected until the shooting is completed, it is determined that a key such as the activation key, the mode selection key and so on is not included in the shooting time operation key in this specification.

Also, since there is no problem if the camera function setting key, such as the activation key, the mode selection key and so on, is disposed without mixing-interfering with the shooting time operation key, such as the shutter key and so on, for example, itthe portable terminal may be configured such that, by use of an operation key which ~~was-is~~ disposed on the front surface of the portable telephone, the camera function is activated or the motion picture mode or the still picture mode is switched, and by use of the sub operation key 107 (shooting time operation key), which ~~was-is~~ disposed on the back surface, the shooting is conducted.

In the meantime, in accordance with this embodiment, as shown in Fig. 1(4), it

~~was the portable terminal is configured such that the sub operation key 107 is disposed on a downside than below the sub display part 104 with on the opposite side relative to the hinge part 300 as a standard, and they are used in that physical relationship. That is, it is configured the configuration is such that the sub display part 104 is disposed between the sub operation key 107 and the hinge part 300. Also, in this embodiment, it is displayed display is produced in such a manner that a downside the bottom of an object of shooting in the main display part 103 is located at the hinge part side, as seen in Fig. 1(1), and that an upside the top of the object of shooting in the sub display part 104 is located at the hinge part side, as seen in Fig. 1(4).~~

Generally, since the main display part 103 and the main operation keyboard 106 in the opened ~~of the portable terminal~~ state, as shown in Fig. 1(1), are used in such a physical relationship that the main operation keyboard 106 is disposed ~~at a downside of~~ ~~below~~ the main display part 103, by setting ~~a~~ the physical relationship of the sub display part 104 and the sub operation key 107 in the closed state according to the above-described structure, for. For example, in a case that where, after a predetermined input and so on was carried out ~~with the terminal device~~ in the opened state, camera shooting is carried out in the closed state, in case that after camera shooting was carried out in the closed state, a predetermined input and so on is carried out, and so on, it becomes possible to operate ~~the portable terminal~~ without changing ~~a~~ the hand which holds the housing 201 (without reversing top and bottom of the housing 201), and whereby the operability thereof is improved.

In addition, as shown in a publicly known reference 1, there is such a structure that a structure is known in which an operation key is disposed on an under part of the

main display part in the same housing, but in this case, there ~~it is a necessity~~ necessary to operate with shifting a lower housing upwardly; and, when the operation is carried out while holding the lower housing, it becomes an operation which straddles the hinge part, so that key depression becomes unstable. Also, in case that there is a camera located at the hinge part, the camera is interrupted ~~likely to be covered~~ by a finger and a ~~or the~~ hand on the occasion of operating a key, and it is not one which ~~making it difficult~~ to realizes an operation of stable camera shooting and so on without changing ~~at the~~ hand which holds the housing 201 (without reversing top and bottom of the housing 201), which is mentioned ~~in the embodiment above~~.

Next, ~~at the~~ shape of the sub operation key 107 will be described ~~by use of~~ with reference to Fig. 13(1) to Fig. 13(3). Fig. 13(2) is an enlarged view of the operation key 107, and Fig. 13(3) is ~~an example of~~ a cross sectional view taken along y-y in Fig. 13(1) in which the housing 200 ~~was cut at~~ is seen on a plane which is parallel to the hinge part 300.

Here, as shown in Fig. 13(2), a depression recessed surface of the sub operation key 107 is disposed in such a manner that the sub operation key 107 does not protrude from the back surface of the housing 200. By this design, for example, it is possible to prevent ~~such a wrong operation that~~ in which the sub operation key 107 is mistakenly depressed in ~~a case that a where the portable telephone was~~ is put into a trousers pocket, a jacket pocket, or a bag and so on.

Also, as shown in Fig. 13(3), ~~it the structure is configured such that~~ when the depression recessed surface of the operation key 107 is depressed by a user, and a key switch gets ~~in touch~~ is moved into contact with a substrate, and thereby, an input

signal is inputted to CPU 110, and to initiate a selection operation and soon which a user wishes is carried to carry out. Here, the depression-recessed surface of the sub operation key 107 means refers to a surface which is contacted in case that a the user depresses an the operation key.

Also, as described above, since there is a fear of concern that a wrong operation will occur when the sub operation key 107 is disposed on the back surface, it is desirable to configure this key in such a manner that the sub operation key 107 it is configured to be able to be locked to disable the inputactuation thereof. In this case, the CPU 110 may process function so as to enable or disable an input of from the sub operation key 107 on the basis of a sub operation key enable signal or a sub operation key disable signal, which was inputted through an exclusive use key or a setting screen and so on.

In the same manner, in the portable telephone of this embodiment, it is configured that camera shooting in the folded state can be carried out through operation of the sub operation key 107, and it is possible to carry out camera shooting in the opened state through operation of the main operation key 106. Therefore, to configure cause the CPU 110 so as not to not accept an input of the sub operation key 107 when the portable terminal is in the opened state becomes effective for improving the usability thereof. In this case, it is configured that a fold the folded state is detected by the fold detection part 108, and, in case that the opened state was-is detected, the input of the sub operation key 107 is not accepted. At the same time, it the system may be configured so as to turn OFF a display of the sub display part 104, under these circumstances.

On one the other hand, it is possible to have the sub display part 104 active for displayed when the portable terminal is in the opened state, but; however, in this case, it is desirable that, by reversing the reverse the top and bottom of an object of shooting from the way which was it is displayed when the portable terminal is in the closed state, while and then, by displaying it when the portable terminal is in the open state, a so that the relationship between the top and bottom of the object of shooting on the main display part 103 and that on the sub display part 104 are made to be equal the same. Also in In this case, a folded state of the portable terminal is detected by the fold detection part 108, and the relationship between the top and bottom of an object of shooting, which is displayed on the sub display part 104, is made to differ between that in the opened state and that in the closed state.

Next, camera shooting in the closed state of the portable terminal by use of the sub operation keys 107, which was briefly described so far, will be described in more detail. Fig. 3 is a flow chart thereeof this operation, and Fig. 5 is shows an example of a display screen which is displayed on the sub display part 104 during this operation.

In addition, here, as shown in Fig. 1(2) and Fig. 1-(4), it is assumed that there are two sub operation keys 107 (107a, 107b) on the back surface of the housing 200. For example, in a display screen as shown in Fig. 5(2), it is configured assumed that the key 107a plays a role of functions to control "ZOOM", as seen at a lower left of on the screen, and they key 107b plays a role of functions to control "RECORD", as seen at a lower right of on the screen. That is, it is configured that the two functions which were displayed at the lower right side and the lower left side in the sub display part 104, during this operation, are made to correspond to the two (left and right) sub operation

keys 107 are made to correspond, and so that by depressing the right side sub operation key 107b, the function which was displayed at the lower right side in the sub display part 104 is realized, for example.

Firstly, the CPU 110 stores opened and closed state information, which was detected by the fold detection part 108, in the volatile memory 102a, for example, "0" in the opened state, and "1" in the closed state. And, the CPU 110 refers to the opened and closed state information which was stored in the volatile memory 102a, and controls it carries out control so as to have the main display part 103 displayed a predetermined display screen in the case of the closed state, and controls so as to have the sub display part 104 displayed a predetermined display screen in the case of the closed state.

In this embodiment example, it is detected to be assumed that the portable terminal is in the closed state, and an idle screen is displayed on the sub display part 104 (S300, Fig. 5(1)).

Firstly, the processing, which is carried out in case that the motion picture mode was selected by the mode selection key 105, will be described.

For example, when the mode selection key 105 is slid upward, a camera mode activation signal and a motion picture mode signal are inputted into the CPU 110, and the CPU 110 activates the camera 109 (S302) and refers to the opened and closed state information which was stored in the volatile memory 102a (S303), and Then, image information of an image which was taken by the camera 109 is displayed on the sub display part 104 through under control of the CPU 110, and a motion picture monitor is started (S304, Fig. 5(2)). On this occasion, on the sub display screen, either

than in addition to the a-motion picture which was-is being monitored, ZOOM and RECORD are displayed as functions which can be carried out.

In addition the foregoing example, here, a selection of the camera mode activation and the motion picture mode is-was carried out by-as one operation, but it-the invention is not limited to this, and there is no problem if an operation for activating the camera mode and an operation for selecting the motion picture mode are carried out separately.

Next, a user selects whether magnification of at the size of information of an the image which is being was displayed on the sub display part 104 is to be adjusted (zoom adjustment) or not (S305). In the case of carrying out the zoom adjustment, for example, on a screen of Fig. 5(2), the sub operation key 107-a to which a role controls of "ZOOM" was assigned is depressed, and, on the basis of a sub operation key ID information signal which was-is inputted from the sub operation key 107a, the CPU 110 changes a set value of the electronic zoom magnification which was stored in a register (not shown) of the camera 109. Next, the CPU 110 counts an the adjustment level of the zoom adjustment (S313), and, on the basis of that level, a zoomed display of the image information is carried out (S304). That is, in case that the set value of the electronic zoom magnification was changed, information of an image which was taken by that magnification is displayed on the sub display part 104 through under control of the CPU 110 (zoom adjusting method 1).

Also, at this time, the CPU 110 displays a zoom adjustment level on the sub display part 104, for example, it displays "x2", as shown in Fig. 5(10), and so as to informs a the user of the zoom adjustment level.

—Also, in this embodiment, it is configured possible to carry out the zoom adjustment in incremental steps by repeating depression-repeated actuation of the sub operation key 107a, and for example, in case of 3three steps as the steps of zoom adjustment, every time that the sub operation key 107a is depressed, the CPU 110 processes functions to advance the zoom in such a manner that at the level eventually returns to a normal level (level 1) next following to a top level (level 3), like a level 1 → a level 2 → a level 3 →, the level 1 → the level 2.

—In addition, the zoom adjustment may be carried out successively by continuously depressing the sub operation key 107a for a long time, rather than but not in incremental steps.

Next, in case that the zoom adjustment is not carried out, or in case that motion picture shooting is started after the zoom adjustment was has been completed, for example, as seen in a screen of Fig. 5(2), the sub operation key 107b, to which a role controls the function of “RECORD” was assigned, is depressed, and the motion picture shooting is started (S306).

In this case, the CPU 110, on the basis of the sub operation key ID information signal which was is inputted from the sub operation key 107b, compresses image information of an image which was taken by the camera 109 as motion picture preparation use image data, and it stores the compressed data in the volatile memory 102a, and. It then displays the information of an image which was taken by the image pickup camera 109 on the sub display part 104 (S307, Fig. 5(3)). Also, the CPU 110 activates the microphone 111, and compresses sound data which is outputted from the microphone 111 to CPU 110 as motion picture preparation use sound data, and stores

the compressed data in the volatile memory 102a. On this occasion, during a period that in which motion picture shooting is being carried out, in order to inform a user that monitor motion picture shooting is going on, the CPU 110, for example, as shown in Fig. 5(3), displays a character of "REC" on the sub display part 104, and it displays a transitional state of current record-recording time so as to record the setting time by means of numerical characters and so on. ByIn this way, a user can recognize that the motion picture shooting is going on and how much record-recording time remains, so that the usability is good.

Also, if it can be simply seen that the motion picture shooting is going on, a mode to be informed the manner in which such information is indicated is not limited to the above-described one, and a bar graph, an icon and so on may be utilized (Fig. 5(11)). ByIn this way, it is possible to recognize viscerally that the motion picture shooting is going on and how much the recording time remains.

On one the other hand, CPU 110, when the motion picture shooting is started, the CPU 110 refers to the record setting time information which was stored in the volatile memory 102a, and it starts a timer function which has the referred-record setting time as a set value in CPU 110. In case that the time which was-is being counted by the timer function passes over the record setting time (S308), or in case that a user, for example, as seen in a screen of Fig. 5(3), carries out an operation, such as depressing the sub operation key 107b to which atthe role of "STOP" function was assigned, and so on (S309), the CPU 110 stops compression of the motion picture preparation use image data and the motion picture preparation use sound data, and stops operation of the camera 109 and the microphone 111, and combines the compressed motion picture

preparation use image data and the motion picture preparation use sound data, and, thereby, prepares a file of a MPEG4 format, and stores it in the volatile memory 102a. During a period of carrying out this processing, the CPU 110, for example, by use of a screen as shown in Fig. 5(4), informs the user that "DURING PROCESSING" is going on, so as not to give concern of a failure and so on to the user.

Furthermore, the CPU 110 refers to information of a head 1 frame from the motion picture data, which was stored in the volatile memory 102a, and carries out decoding processing of the information of the head 1 frame which was referred to, and displays the decoded image information (1st frame) on the sub display part 104 (S310).

And, a user refers to the image information of this 1st frame, and he/she can select whether the motion picture information which was stored in the volatile memory 102a so far is to be stored in the non-volatile memory 102b or not (S311).

In case that the motion picture information stored in the volatile memory 102a is stored in the non-volatile memory 102b, for example, as seen in the screen of Fig. 5(25), when the sub operation key 107b to which a role of the function "STORE" was assigned is depressed, the CPU 110, on the basis of the sub operation key ID information signal which was inputted, stores the file of MPEG4 format that is stored in the volatile memory 102a in the non-volatile memory 102b (S312). After that, when the sub operation key 107b to which a role of the function "CONFIRM" was assigned is depressed, the CPU 110 again starts again the motion picture monitoring (Fig. 5(6)).

On one the other hand, for example, as seen in the screen of Fig. 5(5), when the sub operation key 107b to which a role of the function "RETURN" was assigned is depressed, the CPU 110 displays information of an image which was taken by the

image pickup camera 109 on the sub display part 104, and again starts again the motion picture monitoring (S304, Fig. 5(2)).

On one hand, in In case of returning to the motion picture monitor display again, without storing the motion picture that is stored in the volatile memory 102a in the non-volatile memory 102b, for example, as seen in a the screen of Fig. 5(5), when the sub operation key 107a to which a role of the function "RETURN" was assigned is depressed, a motion picture shooting data deletion signal is inputted in to the CPU 110, and the CPU 110 deletes image data which was stored in the volatile memory 102a from at the start of motion picture shooting efat S307, and it displays information of an image which was taken by the image pickup camera 109 on the sub display part 104, and following which starts again the motion picture monitoring is started again (S304, Fig. 5(2)).

In addition, in the case of finishing the motion picture shooting, it is finished ended by sliding the mode selection key 105 upwardly again. That is, the CPU 110, on the basis of a signal from the mode selection key 105, displays an idle screen, as shown in Fig. 5(1), on the sub display 104.

Also, it may be configured that the CPU 110, for example, displays an item ef "RETURN" at at the lower left of at the screen of Fig. 5(3); whereby, and in case ef there is no "STOP" operation within the above-described record setting time, when the sub operation key 107a to which a role of the function "RETURN" was assigned is depressed, the CPU 110 stops compression of the motion picture preparation use image data and the motion picture preparation use sound data, and stops operation of the microphone.

By ln this way, in case that the motion picture shooting is mistakenly started, and or in case that a user starts the motion picture shooting but changes his/her mind and wishes to stop the motion picture shooting, it is possible to quickly return to a monitoring state of the motion picture shooting. On that account, it is possible to ~~heighten enhance~~ the efficiency of processing of the CPU 110, so that the usability is improved.

Also, at the method of carrying out the zoom adjustment is not limited to the above-described method, and for. For example, it may be configured that a the set value of pickup image size of the image pickup camera 109 is changed, and from information of an image which was taken by the camera 109 after the set value was changed, a size of the image of a size before such change is pulled out.

Next, processing in the case that where the still picture mode was selected by the mode selection key 105 will be described. In addition this regard, since the processes from steps S301 to S303 is are the same as in the motion picture mode, a description thereof will be omitted. However, there is a difference on a point in that the mode selection key 105 is slid to at the downside to which the still picture mode function was assigned.

When the still picture mode is started (S314, Fig. 5(7)), a user selects whether adjustment of the magnification of a the size of information of an image which was displayed on the sub display part 104 (zoom adjustment) is to be carried out or not (S315). In addition, since an the operation in case of for carrying out the zoom adjustment (S315, S321) is the same as that in the motion picture mode, a description thereof will be omitted.

Next, in case that the zoom adjustment is not carried out, or in case that motion

picture shooting is carried out after the zoom adjustment was has been completed, for example, as seen in a~~the~~ screen of Fig. 5(7), the sub operation key 107b to which a role of the function "SHOOT" was assigned is depressed, and ~~the~~ still picture shooting is carried out (S316). In this case, the CPU 110, on the basis of the sub operation key ID information signal which was inputted from the sub operation key 107b, compresses information of an image which was taken by the camera 109 as motion picture preparation use image data, and stores the compressed data in the volatile memory 102a; for example, it stores it as data of having a format like YUV(4:2:2) in the volatile memory 102a, and. Then, it stops the shooting of the camera 109 (S317) and displays the information of an image which was stored in the volatile memory 102a on the sub display part 104 (S318, Fig. 5(8)).

After that, at~~the~~ user selects whether the still picture which was stored in the volatile memory 102a is to be stored in the non-volatile memory 102b or not (S319, Fig. 5(8)).

In the case that where the still picture which was stored in the volatile memory 102a is to be stored in the non-volatile memory 102b, in such a~~the~~ state that in which the information of an image which was shot is being displayed on the sub display part 104, for example, as seen in a~~the~~ screen of Fig. 5(8), the sub operation key 107b to which the function a role of "STORE" was assigned is depressed (S319). By this operation, on the basis of the sub operation key ID information signal which was is inputted from the sub operation key 107b, the CPU 110 compresses the data of YUV (4:2:2) format which was stored in the volatile memory 102a by, for example, JPEG format, and stores it in the non-volatile memory 102b (S320, Fig. 5(9)).

Also, in the case of returning to the still picture monitor display (Fig. 5(7)) in such athe state that in which information of an image which was shot was-is being displayed on the sub display part 104 (Fig. 5(8)), for example, as seen in the screen of Fig. 5(8), when the sub operation key 107a to which a role of the function "RETURN" was assigned is depressed (S316), the CPU 110 again starts again the shooting of the image pickup camera 109, and displays the information of an image which was-is taken by the image pickup camera 109 through-under control of the CPU 110 on the sub display part 104, and starts again the still picture monitoring (S314).

Also, in case of finishing the motion picture shooting, it is finished-ended by sliding the mode selection key 105 downwardly again. That is, the CPU 110, on the basis of a signal from the mode selection key 105, displays an idle screen, as shown in Fig. 5(1) on the sub display part 104.

By the foregoing operations, without taking the trouble to open at the portable telephone, the motion picture mode or the still picture mode is made to-can be activated, and by utilizing the sub operation keys 107a and 107b, which were-are disposed on the back surface, it is possible to carry out the-image shooting, so that the usability of the portable telephone is improved.

Also, since a user displays the information of an image which was taken by the image pickup camera 109 is displayed on the sub display part 104, before storing-the user stores the image information in the non-volatile memory 102b, and-so that after that, he/she can select whether it is to be stored in the non-volatile memory 102b or not, it is possible to store only an image which a user really wish-wishes to store in the non-volatile memory 102b, so that the usability is goodimproved.

Furthermore, since there is no necessity to store information of an image which was has failed to be taken and information of an image which was mistakenly taken in the non-volatile memory 102b, it is possible to effectively make use of a limited memory capacity.

In addition, image information of a motion picture or a still picture which was taken, for example, is stored in the memory 102 by use of a format as shown in Fig. 4 (S312, S320). ~~It~~ This information is recorded in association with each item, such as, for example, ~~as~~ a storage format, an "image number" which represents a number of ~~information~~ of an image which was taken, an "image data name" which represents a name ~~of~~ which identifies the image data, a "data format" which represents ~~the~~ data format, such as JPEG, MPEG and so on, an "amount of data" which represents ~~the~~ capacity of ~~the~~ data, an "image pickup date" which represents ~~at~~ the date of ~~the~~ image pickup, and "GPS additional information" which represents additional information, such as GPS information. ~~and so on,~~ "Copyright information is also recorded indicating the good and status bad of an attachment to a-mail of copyright information" which represents whether it is ~~good acceptable~~ or not to attach data of an image ~~which was taken~~ to a-mail, "the good and bad status of serial transfer of copyright information" which represents whether it is ~~good acceptable~~ or not to serially transfer data of an image ~~which was taken~~ to another information processing terminal, for example, a PC, FDA, a portable telephone and so on, and "the number of possible reproductions of copyright information (or time of possible reproductions)" which represents the number (or time) of reproduction of data of an image which was taken, and so on. If ~~it~~ the information is stored in the suchlike described manner, it is suitable available on the

occasion of utilizing data of an image which was taken.

In the meantime, the above-described sub operation key 107 is controlled by the CPU 110, and even if the same key was depressed, in a different state, it may be treated as a different input signal.

For example, the sub operation key 107 is, in the case of a normal standby state, for example, as shown in Fig. 14, used for switching a screen of the sub display part 104. Hereinafter, this operation will be described by use of with reference to Fig. 14.

Fig. 14(1) is shows an example of a screen in which set information of a mode, such as "MANNER MODE" and so on, was is displayed, and Fig. 14(2) is shows an example of a screen in which current time information was is displayed in an enlarged manner, and Fig. 14(3) is shows an example of a screen in which newly arrived information of concerning a telephone call, a mail and so on was is displayed.

In each screen of Fig. 14(1) to Fig. 14(3), the sub operation key 107a functions as a "RETURN" key, and the sub operation key 107b functions as a "NEXT" key.

When the "NEXT" key 107b is depressed, a screen transition signal is inputted to the CPU 110 as an input signal, and, in response to CPU 110 which received the screen transition signal, the CPU 110 switches at the display screen of the sub display part 104 to at the next screen. By repeating this operation, at the screen is switched in such manner the sequence of Fig. 14(1) → Fig. 14(2) → Fig. 14(3) → Fig. 14(1) →

On the one hand, when the "RETURN" key 107a is depressed, a screen return signal is inputted to the CPU 110 as an input signal, and CPU 110 which received in response to the screen return signal, the CPU 110 switches a display screen of the sub display part 104 to a previous screen. By repeating this operation, a screen is switched

in such manner the sequence of Fig. 14(1) → Fig. 14(3) → Fig. 14(2) → Fig. 14(1) →

....

In contrast to this, in the case of the camera mode, in which shooting is carried out by the image pickup camera 109, the sub operation key 107a is assigned by CPU 110 as an operation key regarding camera shooting, for example, as the shutter key, and when the sub operation key 107a is depressed, a shutter signal is inputted into the CPU 110 as an input signal.

In addition, as seen in Fig. 14(3), in case that there is no newly arrived information, it may be configured that the number is displayed as "0", and a screen itself of such as shown in Fig. 14(3) is not displayed. In this case, it is controlled by the CPU 110 effects control in such a manner that, when the "NEXT" key 107b is depressed in the case of Fig. 14(2), if the screen is changed to that of Fig. 14(1), and when the "RETURN key 107a is depressed in the case of Fig. 14(1), if the screen is changed to Fig. 14(2)".

By In this way, by such an arrangement that the to cause a screen itself regarding for showing newly arrived information to be is not displayed in case of there is no newly arrived information, a user can confirm the presence and absence of newly arrived information sensuously by a transition state of a the screen, so that the usability is goodimproved.

As described above, since the sub operation key 107 changes a role the function of an input signal as the case may be and one operation key can be used to initiate play a plurality of rolesfunctions, in a small size terminal, like a portable telephone, it is possible to effectively make use of a space, which contributes to reduction of the circuit

size.

Furthermore, for example, in case of playing a game by using making use of the sub display part 104, and in case of displaying information regarding music, such as a music file etc. of mp3 format etc. in the sub display part 104, it is possible to make use of it-the sub operation key 107 as an operation key for themthese functions.

In addition, in the above-described embodiment, the case-an example of completing camera shooting in the closed state was described, but next, a structure which enables camera shooting successively continuously, even if it goes into such a state that a when the portable telephone was-is opened in midstream of its operation, will be described.

In this case, the CPU 110, if it confirms that it goes into the portable terminal has changed to the opened state from the closed state with reference to the opened and closed state information which was detected by the fold detection part 108, holds once-a the state of a the camera operation which was carried out by the sub operation key 107 so far (a the display screen in use, a the zoom adjustment level and soon), and displays a display screen which was associated in advance associated with the display screed screen which was held on the main display part 103 (e.g., Fig. 5(12)).

Here, in the non-volatile memory 102b, a display screen produced in each step which is displayed on the sub display part 104 (e.g., Fig. 5(1) to Fig. 5(9)) and a display screen produced in each step which is outputted to the main display part 103 are stored in association with each other. In addition, although it is not shown in the figures, it is configured that the CPU 110 outputs a screen which corresponds to Fig. 5(1) to Fig. 5(9) as a display screen which is displayed on the main display part 103 when the

portable terminal is in the opened state. In this case, it is desirable that the number of display screens which are displayed on the sub display part 104 is made to be equal to the number of display screens which are displayed on the main display part 103.

Fig. 5(12) is similar to Fig. 5(1) and shows an example of a display screen which was-is associated with it,; and, in a ~~state that a~~ the case where the portable telephone was-is in the opened state, it is possible to make use of the main operation key 106. On that account, ~~ether than~~ in addition to "ZOOM" and "SHOOT", adjustment of "EXPOSURE" is assigned to the operation key, and also, taking the size of an the area of the main display part into consideration, it was-is designed that to also display information indicating a remaining amount power capacity of a rechargeable battery, the time and so on are also displayed. Also, taking the difference of a ~~in~~ screen size between the sub display part 104 and the main display part 103 into consideration, information of an image which was taken by the camera is processed so as to be displayed with a size which is coordinated with the screen size.

ByIn this way, even if the portable telephone in the closed state was-is changed to the opened state during a period ~~that~~ in which the camera shooting function is activated, it is possible to carry on with the camera shooting through a display screen which is suited to the respective states, so that the usability is improved. It is the same as in the case that where the portable telephone in the opened state was-is changed to the closed state.

In addition, the associated display screen is not limited to a display screen as shown in Fig. 5(12), but, for example, it may be configured that the display screens which are displayed on the sub display part 104 and the main

display part 103 become a similar screen, with similar key assignment. If it is configured sein this way, there is such an advantage in that, even if the portable telephone in the opened state is transferred changed to the closed state, at the camera operation can be carried on by a similar operation.

Also, here, in order to easily carry out a search of the associated display screens, search information is added to each display screen data, such as, for example, in a screen as shown in Fig. 5(7), "sub07" is added, and in a display screen which is displayed on the main display part which corresponded to that, "main07" is added. On the basis of this search information, the CPU 110 searches for a screen to be outputted, and outputs it to the respective display parts. ByIn this way, it is possible to heighten enhance the search efficiency of the associated display screens. In this case, by making use of the search information, a display mode to be displayed on the sub display part 104 and a display mode to be displayed on the main display part 103 are stored in the non-volatile memory 102b in such a manner that the modes are associated with each other.

As described above, switching from main to sub in camera shooting was describedtaken as an example, but itthe invention is not limited to the camera shooting, and it is applicable to onean operation which outputs an image to a predetermined display screen.

InOn the meantimeother hand, as shown in Figs. 1(2) and 1(4) etc., the reason thatwhy the number of sub operation keys to which the shooting time operation key was assigned is set to be 2two is because anthe area of the back surface of the housing 200 is limited, and itif the number of keys becomes 3three and more, at the

distance between keys becomes narrower, so that there is a ~~fear to invite such concern~~
~~that a wrong operation will occur, that in which~~ an adjacent key is mistakenly depressed
and so on.

Therefore, for example, if it is configured so as in order to prevent a fear of
~~concern that a wrong operation by changing may occur, the shape of a key, such that~~
~~providing one is as~~ a slide type key (Fig. 12(1)), and by making ~~at~~ the distance between
keys larger (Fig. 12(2)), it ~~may be configured that is possible to provide~~, for example,
~~3~~three keys, and more of the shooting time operation keys, such as the shutter key, the
zoom adjustment key and so on, are disposed on the back surface of the housing 200.

Also, here, as shown in Fig. 12(2), in case of a ~~3~~three key structure on the back
surface, it is possible to make use of a circuit regarding main operation keys 106a, 106b
and 106c for sub operation keys 107a, 107b and 107c on the back surface without any
change, which contributes to a reduction of the manufacturing cost.

Also, in case that ~~the~~ sub operation key 107 is ~~2~~provided as two keys, since
~~there is a fear concern that, when the two sub operation keys 107a and 107b to be~~
~~disposed are disposed to be two keys up and down above and below each other, when~~
~~the upper operation key was is pressed by at the thumb, and the down lower operation~~
~~key is will also be depressed, so that the usability is bad. Thus, as shown in Figs. 1(2)~~
~~and 1(4) etc., they may should be disposed on the left and right; and, for example, as~~
~~shown in Fig. 12(2), it is even more preferable to have disposed them with shifted as~~
~~shifted in an oblique direction.~~

Also, it is preferable to configure that if, for example, the functions of the sub
operation keys 107a and 107b at the time of camera operation are made to be the same

as that those of the main operation keys 106a and 106b, and an operation when the portable terminal is in the opened state is made to be the same as an the operation performed when the portable terminal is in the closed state. That is, it is preferable to configure so as to be able to realize similar ones to processing operations to those which were shown in described with reference to Figs. 3 and 5 by use of the main operation keys 106a and 106b when the portable terminal is in the opened state. By in this way, at the necessity to take the trouble to change operations between in the opened state and in the closed state of the portable terminal is eliminated, so that the usability efby a user is improved.

Furthermore, in this embodiment, a sound hole is disposed between the sub operation keys 107a and 107b, and by this, a user can easily identify at the position of the sound hole by tactile sensation. On, and on the basis of that, at the physical relationship of both keys becomes clear, and, therefore, without taking the trouble to identify at the position of the key, it is possible to operate it sensuously. Also, by in this away, the distance between the sub operation keys 107a and 107b is taken apparent, so that it is possible to prevent a wrong operation, such as a wrong key depression and so on.

In addition, here, the sound hole of a music speaker was is disposed between the sub operation keys 107a and 107b. However, if the invention is not limited to this, but, in order if it is possible to clarify at the physical relationship of the both keys, a convex prong or a concave groove and so on may be disposed therebetween. In the meantime addition, in this embodiment, the mode selection key 105, which is used also as the activation key was, is formed on the side surface of the housing 201 by use and

is in the form of a slide type key, but; therefore, since a certain degree of power force is required in order to have slide the operation key slid for mode selection, it is configured so as to prevent a wrong operation of a by the user. In particular, the usability is good on a from the point of view that, even if the mode selection key 105 was is depressed without sliding when the housing was is held, it is the key will not be operated.

Also, assuming that the mode selection key 105 is disposed on the side surface of the housing 200, and that when sliding it upward when the portable telephone is in the closed state, a the mode is transferred to the motion picture mode, and when sliding it downward, it is transferred to the still picture mode. When, when sliding it upward in a state that a when the portable telephone was is opened, although it was is transferred to the motion picture mode in the closed state, here, it is transferred to the still picture mode.

Therefore, as shown in Fig. 1, when a slide type key is used as the mode selection key 105 and it is disposed on the side surface of the housing 201, regardless of the opened and closed states of at the portable telephone, the same mode selection can be realized by the same slide operation, so that usability is goodimproved.

Next, processing the operations of the main display part 103 and the sub display part 104 at the time of camera shooting will be described.

Firstly, in a state that a the operations that are performed when the portable telephone was is in the opened state, it will be described. In a case that where the a lens of the image pickup camera 109 was is directed toward a the user, unless a pickup the image of at the user himself/herself at this time is displayed on the main display part 103 by as a mirror image, for example, in a case that where at the user moveds to the

right, but, on the screen, it is the displayed image shows that a the user has moved to the left, and there is a problem that it is hard to shoot. On that account, the CPU 110 detects that a the portable telephone is in the opened state by use of the fold detection part 108, and detects that the image pickup camera 109 faces toward a the user by use of, for example, a sensor, a switch and so on, and in response to which the CPU 110 carries out flip-a horizontal reversal of a the image.

Next, in a case that a where the lens of the image pickup camera 109 is directed toward an object of shooting, which was-is opposed to a the user, in a state that a in which the portable telephone was-is in the opened, at this time, if the image pickup camera 109 is approximately 180 degrees folded around a the X-X axis of Fig. 1(1), a the image which is displayed on the main display part 103 becomes upside down. In this connection, the CPU 110 detects that a portable telephone is in the opened state by use of the fold detection part 108, and detects that the image pickup camera 109 faces toward a user an object of shooting by use of, for example, a sensor, a switch and so on, and carries out flip-performs a vertical flipping of a the image. Also, in this case, it is also possible to display an image which was taken in by the image pickup camera 109 on the sub display part 104; and, on this occasion, the CPU 110 detects that a the portable telephone is in the opened state by use of the fold detection part 108, and detects that the image pickup camera 109 faces toward a user by use of, for example, a sensor, a switch and so on, and carries out flip-performs a horizontal flipping of a the image, and displays it whereby the image is display upright on the sub display part 104.

Next, a state that the operations which occur when a portable telephone was-is in the closed state will be described. In case that a the lens of the image pickup camera

109 is directed toward ~~a~~the user in the state that ~~a~~while the portable telephone was ~~is~~
in the closed state, at this time, as described above, since an image which is displayed
on the sub display part 104 should be a mirror image, ~~the~~ CPU 110 detects that ~~a~~the
portable telephone is in the closed state by use of the fold detection part 108, and
detects that the image pickup camera 109 faces toward ~~a~~the user by use of, for
example, a sensor, a switch and so on, and ~~carries out flip~~performs a horizontal flipping
of ~~an~~the image.

Next, in case that ~~a~~the lens of the image pickup camera 109 is directed toward
an object of shooting which is positioned opposite to ~~a~~the user in the state that ~~a~~while
the portable telephone ~~is in the~~was ~~closed~~state, as described above, since ~~a~~the
image is displayed upside down on the sub display part 104, ~~the~~ CPU 110 detects that
~~a~~the portable telephone is in the opened state by use of the fold detection part 108, and
detects that the image pickup camera 109 faces toward ~~a~~useran object of shooting by
use of, for example, a sensor, a switch and so on, and ~~carries out flip~~performs a vertical
flipping of ~~an~~the image.

As described above, by detecting the opened and closed states of ~~a~~the portable
telephone and ~~a~~the direction ~~of~~in which the camera is pointing at that time, and by
having a display ~~mode~~ of the main display part 103 or the sub display part 104 flipped
horizontally or flipped vertically, ~~the~~ usability at the time of shooting is improved.

Also, in case that the camera is directed toward an object of shooting in the
opened state, by displaying an image pickup monitor screen not only on the main
display part 103, but also on the sub display part 104, a person who is ~~shot~~the {object
of shooting} can also confirm ~~a~~the state of shooting himself/herself, and, therefore, it is

possible to ~~be shot~~ perform the shooting at ease.

Still also, it may be configured that after shooting, without any change of the state that in which a portable telephone ~~was~~ is closed, by use of the sub display part 104, confirmation or deletion and so on of an image which was taken ~~is~~ can be carried out.

In this case, for example, when at the mode is changed to a browsing mode for confirming images which were taken by the mode selection key 105, the CPU 110 displays the images which were taken on the sub display part 104. As a display mode, it is fine if the images which were taken can be confirmed, and, for example, the images which were taken may be displayed one by one in ~~an~~ a chronological record order of recording, or they may be displayed as a list. On that occasion, if a user selects an image which he/she wants to delete by use of the sub operation key 107 and instructs deletion of an image, an image deletion instruction signal is inputted through the sub operation key 107 to the CPU 110, and the CPU 110 carries out processing to delete image data which was stored in the memory 102.

Also, it ~~may be designed~~ is possible to carry out editing and so on of images which were taken, by use of the sub display part 104. In this case, when at the mode is changed to an editing mode by depressing the mode selection key 105, the CPU 110 displays a screen for selecting an editing function, such as, for example, black and white, sepia, frame and so on, on the sub display part 104. When a user selects any one of the editing functions by operation of the sub operation key 107, ~~the~~ an editing instruction signal is inputted to the CPU 110, and the CPU 110 edits image data on the basis of the editing instruction signal.

By In this way, without taking the trouble to open at the portable telephone after

shooting, and without any change of the state that in which the a portable telephone was is folded, thea limited number of sub operation keys are used; and, thereby, it is possible to carry out confirmation, editing and so on of images which were taken, so that the usability is improved.

Next, processing in case of sending a mail with a still picture or a motion picture which was taken as an attachment file, after the still picture or the motion picture was have been taken, by making use of the above-described sub operation key 107, in a state that a in which the portable telephone was is closed, will be described (second embodiment). Hereinafter, it will be described by use of a, hereinafter with reference to the flow chart of Fig. 6 and at the display screen example of Fig. 7.

In addition, since the processes steps from S601 to S605 of Fig. 6 are ones steps which are formed by simplifying the processes steps from steps S304 to S312 and from steps S314 to S320 of Fig. 3, and Figs. 7(1) and 7(2) are the same as Figs. 5(7) and 5(8), the descriptions thereof will be omitted here.

Now, as seen in Fig. 7(3), the sub operation key 107a functions as a "RETURN" key and the sub operation key 107b functions as a "MAIL" key.

When a signal from this "RETURN" key 107a is inputted to the CPU 110 (S606), the CPU 110 deletes at the display which was being displayed on the sub display part 104, and displays a still picture or a motion picture (1st frame), as shown in Fig. 7(2), newly on the sub display part 104.

On one the other hand, as seen in Fig. 7(3), when a signal from a mail key 107b is inputted to the CPU 110 (S606), the CPU 110 activates the E-mail mode (S607), and secures a region for use in mail editing in the non-volatile memory 102b, and designates

still picture data or motion picture data which was stored in the non-volatile memory 102b as a file which is to be attached to a mail to be sent. Subsequently, the CPU 110 refers to address book data which was stored in the non-volatile memory 102b, and, for example, as shown in Fig. 7(4), displays name information of friends, acquaintances and so on ("AAA", "BBB"...) on the sub display part 104 (S608). Here, the name information, if it represents friends, acquaintances and soon, may not be real names, but may be nicknames, cryptographs or numerical characters and so on.

In Fig. 7(4), the sub operation key 107a functions as a "DECIDE" key, and the sub operation key 107b functions as a "SCROLL" key.

—When a signal from the scroll key 107b is inputted to the CPU 110, the CPU 110 scrolls a cursor-and-so-on-, for example, for selecting a person to which a-mail is to be sent from a list of names information which is displayed on the sub display part 104.

—Also, when a signal from the decide key 107a is inputted to the CPU 110, the CPU 110, in order to confirm at the user whether a person who was selected by the cursor and-so-on-is set to be a destination to which a mail is to be sent or not, displays a display for having a user select availability-of sending mail to the selected person, for example, as shown in Fig. 7(5), on the sub display part 104 (S609).

Also, as seen in Fig. 1(5), in the same manner as shown in Fig. 7(4), the sub operation key 107a functions as a "DECIDE" key, and the sub operation key 107b functions as a "SCROLL" key.

In a state that a case the cursor was moved to at the position of "NO" by the scroll key 107b, when a signal from the decide key 107a is inputted to the CPU 110, the CPU 110 displays a screen for selecting another person to which a mail is to be sent, as

seen in Fig. 7(4), on the sub display part 104. On this occasion, if it is configured to put the cursor is moved to a position of the name information of the destination designated the last time to which a mail is was sent, a necessity to take the trouble to search again in the name information list from its head is eliminated, so that the usability is improved.

On the one hand, in a state that when the cursor was is moved to athe position of "Yes" by the scroll key 107b, when and a signal from the decide key 107a is inputted to the CPU 110, the CPU 110, searches the address book data which was stored in the non-volatile memory 102b by use of a using the name of a person who was selected in S608 as a search key, and refers to a mail address which corresponds to the search key, and copies it in a mail address region for use in editing mails which was secured in the non-volatile memory 102b.

After that, the CPU 110, for example, establishes a link to a communication network, such as a portable telephone network and so on, and then, connects to a mail server (not shown). Subsequently, the CPU 110 outputs data of the region for use in editing mails which is in the non-volatile memory 102b to a communication part 101, and the communication part 101 sends mail data to the mail server through a wireless link which was established previously (S610).

When the sending of the mail data is completed, the CPU 110 finishes terminates the a-connection with the mail server and finishes ends communication by opening the established wireless link, and, for example, as shown in Fig. 7(6), displays a display for an indication informing athe user that the sending of the mail was has been completed on the sub display part 104.

In Fig. 7(6), the sub operation key 107a functions as an "END" key, and the sub

operation key 107b functions as an "ADDRESS" key, and at the user selects whether or not the sending of a mail is to be carried out to a person who is different from the person designated previously, to whom at the mail is was sent, or whether or not the E-mail mode is finished (S611).

When the address key 107b is depressed and a signal from the address key 107b is inputted to the CPU 110, the CPU 110 displays a screen for selecting a person to which when a mail is to be sent, as seen in of Fig. 7(4), on the sub display part 104 (S608), and carries out processes from the above-described steps S609 to S611.

On the one hand, when the end key 107ba is depressed and a signal from the end key 107ba is inputted to the CPU 110, the CPU 110 has causes activation of the E-mail mode finished to end (S612), and carries out at the display of a still picture or a motion picture monitor which was taken in by the image pickup camera 109 (S601)(Fig. 7(1)).

As described above, since it is configured that a the mode is automatically transferred to the E-mail mode, after a still picture or a motion picture was shot in the state that in which the a portable telephone was is closed, without taking the trouble to open at the portable telephone, it is possible to send a still picture or a motion picture which was taken to a person who one wants is, so that the usability is improved.

Also, since it was configured that, in the state that a in which the portable telephone was is closed, without inputting characters, numeric characters and so on, but only by use of an operation for selecting a person to which a mail is to be sent, information of an image which was taken is sent with being attached as an attachment to at the mail, even in the case of the where there is a limited number of operation keys

(sub operation key 107) on the back surface, and so it is possible to quickly send a mail by a simple operation.

Also, normally, in the state that a in which the portable telephone was is opened, since it is possible to make use of the main display part 103 which has a relatively large area and the main operation keyboard 106, which has a plenty plurality of operation keys, outputted is a display screen for inputting a destination to which mail is to be sent, at the subject matter, and at the text (characters, pictographic characters, numeric characters and so on) of the mail are outputted. Therefore, in this embodiment, it is configured that, when the portable telephone is in the opened state, image information is sent to the main display part 103 by an E-mail function which uses s a display screen in which character inputting is available, and it is configured that, when the portable telephone is in the closed state, image information is sent to the sub display part 104 by use of a display screen having no character input. In addition, even when the portable telephone is in the opened state, as shown in Fig. 7, it is also possible to send a mail with the transition of a display screen which prohibits the character input, and, in this case, for example, if it is configured that a user can select a mode by dividing a mode into, for example, a "NORMAL MODE" in which character inputting is available, and a "SIMPLIFIED MODE" in which character inputting is prohibited, the usability is better.

Also, in the above-described embodiments, taking operability and swiftness of operation of the portable telephone in the closed state into consideration, described was an example of sending only image information without inputting text information, such as characters, numeric characters and so on, was considered, but depending on the circumstances, there may be a state that situation in which one wants to send any text

together with image information. In this case, it is this can be realized by such actions that in which a user prepares a given text (title, content of a text and so on), and has the text registered in advance.

And, it is realized by configuring that, after a destination to which a mail is sent was has been determined in steps S609, the CPU 110 copies a text format (title, content of athe text and so on) which was stored in the non-volatile memory 102b in advance to the region for use in editing mails, which was secured in the non-volatile memory 102b, to thereby complete the mail editing, and itthis is sent to the selected sending destination (S610). That is, itthis operation is realized by configuring that a sending text which was registered in advance is sent to the selected sending destination.

By In this way, even in case of when the portable telephone is in the closed state, it is possible to send a text of a format which was registered in advance only by an operation for designating an address of a sending destination, and it becomes possible to send any text to a sending destination.

Also, it may be configured is possible to have a user selected whether a text format is to be sent or not, or a text format which is sent out of a plurality of text formats. ——In this case, the CPU 110, for example, after a screen of such as shown in Fig. 7(5) was has been outputted, outputs a screen like that shown in Fig. 7(7), and athe user selects athe format of athe text to be sent. Here, in case that “NO TEXT” was is selected, the CPU 110 does not copy any texts to the region for use in editing mails, and proceeds so as proceeds to send only image information. Also, for example, as shown in Fig. 7(8), in case that the text format “FORMAT 1” was selected, the CPU 110

displays ~~at~~^{the} content of the selected text format (format 1).

Next, when an input signal is inputted from the sub operation key 107a, which functions as the "RETURN" key in Fig. 7(8)~~is inputted, the~~ CPU 110 processes so as operates to return to ~~at~~^{the} screen of Fig. 7(7). On ~~one~~^{the} other hand, when an input signal is inputted from the sub operation key 107b which functions as a "SEND" key in Fig. 7(8)~~is inputted,~~ the selected text format is copied to the region for use in editing mails₁, which was secured in the non-volatile memory 102b₁ to ~~have cause~~ the mail editing to be completed, and the mail is sent to the selected sending destination (S610, Fig. 7(6)).

~~By~~In this way, a user can select a text format in response to a person to which a mail is sent and information of an image which was taken, so that the usability is good.

Also, since ~~the it was configured that~~a content of ~~at~~^{the} text is displayed prior to mail sending, a user can confirm ain advance the content of ~~at~~^{the} text to be actually sent in advance, and, for example, it is possible to prevent ~~such~~ a wrong operation ~~that in~~ which a text format with a content which is different from that of a text format that one wants is selected. Also, if tiles titles are included, it ~~may be configured~~is possible to have display a list of the titles displayed.

In addition, ~~here, if it is configured that~~ a user can register a plurality of text formats in the non-volatile memory 102 in advance, it is needless to say that the usability is goodwill be improved.

Also, in the above-described embodiment, ~~described~~an example was considered ~~the case that in which~~ information of an image which was taken by the image pickup camera 109 is simply attached to a mail without any change ~~of~~in the closed state of the

portable telephone and the mail is sent together with the image information, but ~~it~~the invention is not limited to this, and a mail which does not have image information attached ~~hereto~~thereto may be sent.

In this case, for example, in a standby state, as shown in Fig. 5(1), ~~it~~ may be configured that activation processing of the E-mail mode can be carried out, and ~~it~~ may be configured that, the in processing which is carried out after this, processing from the above-described steps S607 to S612 (Figs. 7(4) to 7(6)) is carried out.

~~By~~In this way, for example, even in a case that where an electric train on which I get on board a person is riding is involved in the an accident and there is a necessity for the person to quickly contact his/her to a company and home, and so on, since it is possible to get in touch with a superior of at the company, a member of the family and so on by sending a mail having such-a predetermined content, such as, for example, that "Please understand that I will be delayed because of an emergency situation. I will be in touch with you again when ~~it goes into a state that I can am able to contact later.~~" ~~In the~~ This can be accomplished in a state that a in which the portable telephone was-is closed, and by a simple operation, so that usability is improvedgeed.

~~On one~~the other hand, in the embodiments which were described so far, described was the an example that was considered in which mail sending is completed begun with the portable telephone in the closed state, but it is assumed that a portable telephone goes into is changed to the opened stated in the midstream of its operation.

~~—~~In this connection, an example of a technique for alerting the user to return the portable telephone to the closed state again, in case that a portable telephone went into the opened state in the midstream of operation for sending a mail in the closed state, at

the end of transmission will be described.

In this case, the CPU 110, if it confirms that it-the portable telephone went into the opened state, with reference to the opened and closed state information which was detected by the fold detection part 108, during athe period of a mail sending operation, holds ~~once~~the operations which were carried out by the sub operation key 107 so far, and displays on the main display part 103 an alert message of, for example, "A-mMail is being prepared. Please close athe portable telephone." ~~, and soon.~~ After that, the CPU 110, if it recognizes that it went into the closed state, with reference to the opened and closed state information which was detected by the hold detection part 108, displays the display screen, which was displayed on the sub display part 104 right before athe portable telephone ~~is-was~~ opened, on the sub display part 104 again, and processes proceeds so as to continuously carry out the operation.

Byin this way, for example, in case that a user opened athe portable telephone unintentionally in the midstream of an operation for sending a mail while the portable telephone was in the closed state, and so on, since the alert message is displayed on the main display part 103, it is possible to urge athe user to close athe portable telephone and to continuously carry out the operation of mail sending.

In addition, as alert means, for example, to display a color for alerting the user (e.g., red color) on the main display part 103 or the sub display part 104, or to give alert by use of alert sounds, or to give alert by use of a combination of the an alert sound, characters and color information, may be carried out. Or, it may be configured possible to have a user selected a type of the alert sound and characters to be displayed.

Also, in the above-described embodiment, since there was such an assumption

that ~~an~~the operation of mail sending can not be carried out by the main operation key 10
~~keys 106 in case that it went into the portable telephone was changed from the closed~~
~~state to the opened state in midstream of the operation, carried out was and an alert~~
~~was produced for returning the portable telephone to the closed state, but if however,~~
even in the opened state, ~~if~~ the operation of mail sending ~~can be is~~ carried out
continuously by use of the ~~main~~sub operation keys 107, the usability is good.

In this case, the CPU 110, if it confirms that ~~it went into the the portable~~
~~telephone was changed to the opened state, with reference to the opened and closed~~
state information which was detected by the fold detection part 108, holds ~~once~~ the
operations which were carried out by the sub operation key 107 so far, and displays on
the main display part 103 the display screen which was displayed right before ~~at~~the
portable telephone is opened. In this case, the CPU 110 ~~processes operates~~ in such a
manner that the assignment of functions to the operation keys which are displayed at
lower left and right downsides of a display screen of the main display part 103 becomes
the same as that of the sub display part 104. That is, processing is carried out in such a
manner that a display as shown in Fig. 7 and so on is switched from the sub display part
104 to the main display part 103, and in each display screen, ~~ones~~functions which were
assigned to the sub operation keys 107a and 107b are assigned to the main operation
keys 106a and 106b. Also, in case ~~that a~~the portable telephone ~~was is~~ closed again,
similar processing to the above-described processing is carried out.

ByIn this way, a common display screen is utilized in both of the closed state and
the opened state, and ~~re~~uses the functions of the operation keys which were disposed on
the front surface and ~~re~~uses the functions of the operation keys which were disposed on

the back surface, for example, a role~~the~~ function of the main operation key 106a and a role~~the~~ function of the sub operation key 107a, a role~~the~~ function of the main operation key 106b and a role~~the~~ function of the sub operation key 107b, are made to be the same, and thereby, even if ~~at~~ the portable telephone went into ~~was changed to~~ the opened state in the midstream of an operation for sending a mail ~~that was started with~~ the portable telephone in the closed state, it is possible to continuously carry out the mail sending by a similar operation, so that the usability is good.

Next, an embodiment in which a text can be inputted displayed by the main display part 103, which is of a relatively large size, and the main operation keyboard 106, which includes a plenty plurality of operation keys, by opening ~~at~~ the portable telephone after a person to whom a mail is to be sent was selected ~~which the portable telephone was~~ in the closed state, will be described.

In this case, for example, in case that ~~a~~ if the portable telephone was ~~is~~ opened after a sending destination ~~was~~ has been selected on ~~at~~ the screen, as shown in Fig. 7(4), the CPU 110 recognizes that ~~it~~ went into ~~the~~ portable telephone was changed to the opened state, with reference to opened and closed state information which was detected by the fold detection part 108, and it displays on the main display part 103 an input screen wherein characters, numerical characters and so on can be inputted. And, it is configured that ~~a~~ a user, by making use of the main operation keyboard 106, inputs characters and so on in this input screen, and can to carry out the sending of a mail.

By ~~in~~ this way, for example, in case that ~~in~~ which a user was thinking that he/she ~~will~~ would send an email quickly without any change of ~~with~~ the portable telephone in the closed state ~~once~~ at first, but ~~has~~ changed his/her mind in midstream and thought

decides that he/she also wanteds to input also a text and send it, since the input screen for characters and so on are will be automatically displayed on the main display part 103, only simply by opening at the portable telephone, the usability is good. In this case, "after a destination of mail sending was selected" was set as a condition, but it may be configured to carry out similar processing even before a sending destination is selected. In this case, it may be configured is possible simply to automatically activate a normal mail function which is used in the opened state.

As described above, the mail sending function in the closed state was describedconsidered, but it is needless to say that at the key layout, at the display screen and so on are not limited as described relative to this embodiment. Also, as to a structure the operation of sending mail by use of a display screen with not no character input, it is needless to say that it is applicable not only to a fold type portable telephone, but also to other types of portable telephone.

Next, the processing which is carried out in case that a mail was is received in a state that a while the portable telephone is in a was-closed state will be described (third embodiment). Hereinafter with reference to the, it will be described by use of a flow chart of Fig. 8 and at the example of the display screen example of as shown in Fig. 9.

For example, in the standby state in which an idle screen as shown in Fig. 9(1) is displayed (S801), when a mail is received from a mail server through a communication network, such as a portable telephone network, and the communication part 101, the CPU 110, in response to which received a mail reception signal, sends a mail data download request signal to the mail server, and further, the mail server, which has received the download request signal, sends mail data to at the portable telephone

(S802). At this time, the CPU 110, which has received mail data, stores the mail data in a mail reserve region of the non-volatile memory 102b.

Further, at this time, the CPU 110 refers to the mail address of the sender from the mail data which is in the non-volatile memory 102b, and refers-to-searches for a corresponding name by searching in the address book data which areis stored in the non-volatile memory 102b by use of the referred-obtained mail address as a search key, and, for example, as shown in Fig. 9(2), displays-it produces a display for inquiring whether the name of the sender and the content of the received mail are confirmed or not to be displayed on the sub display part 104 (S804).

In Fig. 9(2), the sub operation key 107a functions as a "No" key, and the sub operation key 107b functions as a "Yes" key.

—When a signal from this No key 107a is inputted to the CPU 110, the CPU 110 displays, for example, an idle screen, as shown in Fig. 9(1), on the sub display part 104 (S805). At this time, for the purpose of informing the user that there is mail data which whose content ishas not confirmedbeen displayed, the CPU 110 may display an appropriate icon on the sub display part 104.

On one-the other hand, when a signal from the Yes key 107b is inputted to the CPU 110 (S805), the CPU 110 refers to the mail data which is in the non-volatile memory 102b, and displays a message, for example, as shown in Fig. 9(3), on the sub display part 104 (S806).

In Fig. 9(3), the sub operation key 107a functions as a "RETURN" key and the sub operation key 107b functions as an "IMAGE" key.

—When a signal from this "RETURN" key 107a is inputted to the CPU 110, the

CPU 110 displays, for example, an idle screen, as shown in Fig. 9(1), on the sub display part 104 (S807).

Also, when a signal from the image "IMAGE" key 107b is inputted to the CPU 110, the CPU 110 refers to image data of the mail data which is in the non-volatile memory 102b, ~~and~~ decode-processes the image data, and displays it, for example, as shown in Fig. 9(4), on the sub display part 104.

In Fig. 9(4), the sub operation key 107a functions as the-a "RETURN" key, and the sub operation key 107b functions as a "STORAGE" key.

—When a signal from this "RETURN" key 107a is inputted to the CPU 110, the CPU 110 refers again to the mail data which is in the non-volatile memory 102b, and displays a message, for example, as shown in Fig. 9(3), on the sub display part 104 (S809).

Also, when a signal from the "STORAGE" key 107b to a folder is inputted to the CPU 110, the CPU 110 refers to image data of mail data which is in the non-volatile memory 102b, and copies it in an image reserve region which is in the non-volatile memory 102b (S810). At this time, for the purpose of informing a user that the storage of an image was completed, the CPU 110 may display, for example, a pop-up screen to this effect, as shown in Fig. 9(5), on the sub display part 104.

As described above, in the past, it was necessary ~~was~~ an operation of taking to take the trouble to open a portable telephone and changing change to the E-mail mode to thereby read at the content of a received email, but in this embodiment, by having a user select whether he/she desires to reads at the content of a email or not right after the email was received, the suchlike-troublesome task of opening the portable telephone

can be omitted. Therefore, even when the portable telephone is in the closed state with limited operation keys being available, it is possible to read a mail the content email right after the reception thereof, quickly and by a simple operation, so that the usability is very good.

In addition, since such a case it can be assumed that a user is unaware that a mail was has been received can be assumed, if the system may be configured such that a screen (Fig. 9(2)) for having a user select whether he/she will read at the content of a mail right after the mail was received is deleted after the lapse of predetermined time, and it a server is displayed indicating that there was reception of a mail. By In this way, it is possible to reduce vain unnecessary electric power consumption.

Also, if the system may be configured such that, by opening at the portable telephone, after the screen for having a user select whether the user desires to reads the content of a mail was has been displayed, a body the text of the mail is automatically displayed on the main display part 103. That is, it is possible to make such an arrangement that use the operation to open a portable telephone is as an indication of such an intention of a user that the user will read at the received mail. In this case, it may be configured that, in case that the opened state was is detected by the fold detection part 108, after the CPU 110 has activated the mail function, at the body text of a received email is automatically displayed.

Also, in the above-described embodiment, the case of receiving a mail with image information attached hereto thereto was described considered, but if the invention is not limited to this, and if the system may be configured to receive a mail which does not have image information attached thereto.

In this case, processing regarding attached image information attached, i.e., processes of S801 to S810, are to be omitted. In addition, Figs. 9(6) to 9(8) are show examples of display screens examples in that case. By this way, even in a case that a mail with no image information attached was received, it is possible to read the mail content right after reception in a state that a while the portable telephone was is in the closed state.

Next, a fourth embodiment will be described by use of a with reference to the flow chart of Fig. 10 and an example of a display screen example of Fig. 11. Here, such an example of this embodiment that, in will be described for a case that in which there was reception of a telephone in the state that a call while the portable telephone was in the closed state, also that the user can start a receive the telephone call at ease, will be described.

Fig. 10(1) is a view showing an entire overall system which includes a portable telephone (PORTABLE A) of a user A, a portable telephone (PORTABLE B) of a user B, and a switching machine C. Fig. 10(2) is a process flow chart showing the operations of PORTABLE A in this embodiment, and Fig. 10(3) is a process flow chart in an entire showing the operations of the overall system.

For example, in a standby state in which an idle screen as shown in Fig. 11(1) is displayed (S1001), the switching machine C, which has received (S1101) a calling signal that was sent from PORTABLE B, sends a ring signal for calling out establishing a call to PORTABLE A to from PORTABLE B (S1102).

The CPU 110 of PORTABLE A, which received the ring signal, analyses at the telephone number and so on of PORTABLE B from the ring signal, and searches the

address book data which was is in the non-volatile memory 102b by use of using the telephone number as a search key, and it displays, for example, as shown in Fig. 11(2), name information which corresponds to the search key, on the sub display part 104, and informs atthe user that there is an incoming call (S1003). Here, in case that there is no name information which corresponds to the search key, in the address book data, the CPU 110 displays atthe telephone number of PORTABLE B.

In Fig. 11(2), the sub operation key 107a functions as a "MESSAGE" key, and the sub operation key 107b functions as a "CUT" key.

—When a signal from this "CUT"cut key 107b is inputted to the CPU 110, CPU 110 sends a cut signal to the switching machine C through the communication part 101, and to reject reception, and it then returns to the standby state (S1001), and displays, for example, an idle screen, as shown in Fig. 11(1), on the sub display part 104 (S1004).

Also, when a signal from the message "MESSAGE" key 107a is inputted to the CPU 110 (S1005), the CPU 110 sends a reception permission signal to the switching machine C through the communication part 101 (S1103), and connects a telephone call line (S1104). Next, the CPU 110 refers to response message data which was stored in the non-volatile memory 102b and sends a response message of, for example, "Since I will answer soon, please hang on for a while." and so on to PORTABLE B through the communication part 101 and the switching machine C (S1006) (S1105). At this time, in order to inform atthe user of flowing-the sending of a response message onto PORTABLE B, the CPU 110 displays, for example, a pop-up screen, to that effect, as shown in Fig. 11(3), on the sub display part 104 to hold atthe telephone call state (S1106).

~~At this time, for the purpose of informing a user of the middle of flowing a response message to a calling person, it may be configured to display, for example, a pop-up screen as shown in Fig. 11(4), on the main display part 103.~~

In Fig. 11(3), the sub operation key 107b functions as ~~the-a~~ cut key. When a signal from this cut key 107b is inputted to the CPU 110, the CPU 110 sends a cut signal to the switching machine C through the communication part 101, and finishes to end the telephone call and returns to the standby state, and it then displays, for example, an idle screen, as shown in Fig. 11(1), on the sub display part 104 (S1007).

After the response message was sent to PORTABLE B (S1006), PORTABLE A is opened, and when a telephone call start key (Fig. 11(4)) of the main operation key 106 is depressed, a telephone call start instruction signal from the telephone call start key is inputted to the CPU 110 (S1008). At this time, the CPU 110 stops sending of the response message and sends the telephone call start instruction signal (S1107), and, at the same time, it activates the microphone 111 and at the telephone call speaker 112, and switches from the telephone call state which was held in step S1006 to a state that a-in which the telephone call is available (S1009) (S1108).

As described above, in case that an incoming telephone call of a telephone was received in the state that a-while the portable telephone is in the was-closed state, a response message is informed sent to a calling terminal for now, and after that, without panic, with additional time, a user can start at the telephone call with at the calling person, so that the usability is good.

Also, since at the user can send a response message by a simple operation, such as depressing the sub operation key 107a (message key), it is possible to quickly

convey an intention to answer a telephone call to ~~at~~the calling person, and ~~at~~the calling person can wait for ~~the~~ start of ~~at~~the telephone call at ease.

In addition, in case that ~~the~~ time which has passed from ~~the~~ sending of a response message to ~~at~~the calling terminal until ~~at~~the start of ~~at~~the telephone call exceeded ~~a~~ setting time (hereinafter, referred to as response elapsed time) which was set in advance, an alert for starting ~~at~~the telephone call may be applied communicated to ~~at~~the user. In this case, when a signal from the message key 107a is inputted to ~~the~~ CPU 110 (S1005), ~~the~~ CPU 110 activates a timer function, and starts counting ~~of~~ the elapsed time. After that, it refers to ~~a~~ setting time which was stored in advance in the non-volatile memory 102b, and, in case that the elapsed time exceeded~~s~~ the setting time, ~~the~~ CPU 110 outputs a sound signal ~~for alerting~~ which was stored in advance in the non-volatile memory 102a to ~~the~~a music speaker 113 to alert the user. ~~By~~ In this way, for example, even in ~~the case that~~where a user is unaware that ~~the user he/she has~~ pushed the message key 107a at the time of telephone call reception, since it is possible to urge a user to start a telephone call by use of the alert means, such as an alert sound and so on, it is possible to prevent ~~at~~the calling person from being left in a state ~~that the calling person listened the response message as it is of having to wait for an undesirable length of time~~.

In addition, the alert means is not limited to that considered in the above-described embodiment, but, for example, characters or colors for providing an alert may be displayed on the sub display part 104, and a user is urged to start ~~at~~the telephone call by a combination of alert sounds, characters and color information. Also, the system, and it may be configured to have allow a user to selected a type of alert sounds

and display characters.

Also, in a portable telephone which has an answer phone function for sending a message to a calling person in case ~~that a~~the called person can not answer the telephone call, ~~in case that~~when a response elapsed time ~~has~~ exceeded the time for starting activation of the answer phone function (hereinafter, referred to as the answer phone setting time), the answer phone function is automatically activated, and, therefore, it is impossible to start ~~a~~the telephone call. On that account, ~~it~~the system may be configured to stop the answer phone function, in case that the message key 107a ~~was~~is depressed.

In this case, when a signal from the message key 107a is inputted to the CPU 110 (S1005), the CPU 110 activates the timer function, and starts counting ~~of~~the elapsed time. After that, the CPU 110 is designed to refers to the answer phone setting time, which was stored in advance in the non-volatile memory 102b, and not to carry out processing for sending an answer phone reproduction instruction signal for instructing reproduction of an answer phone, ~~message~~ to ~~a~~the telephone communication line, for example, to an answer phone message service center, even if the response elapsed time ~~has~~ passed over the answer phone setting time.

~~By~~In this way, even if the response elapsed time ~~has~~ passed over the answer phone setting time, the answer phone function is not activated, and, therefore, a user, without panic, can open ~~a~~the portable telephone, and can carry out an operation ~~for~~ starting ~~a~~the telephone call.

In addition, in the above-described embodiment, ~~it was configured that~~ the answer phone function itself is stopped in case ~~that~~ the response elapsed time ~~has~~

passed over the answer phone setting time, but it may be configured to automatically extend the answer phone setting time.

In this case, when a signal from the message key 107a is inputted to the CPU 110 (S1005), the CPU 110 activates the timer function, and starts counting ~~of~~the elapsed time, ~~and after.~~ After that, the CPU 110 processes proceeds to change for extending the answer phone setting time (e.g., 15 seconds) which was stored in advance in the non-volatile memory 102b byto a predetermined preset value (e.g., 30 seconds).

ByIn this way, even if the response elapsed time has passed over the answer phone setting time, since the answer phone function is not activated for a certain amount of time (here, 30 seconds), a user can open atthe portable telephone without panic, and carries out an operation for starting atthe telephone call.

In addition, it is needless to say that ~~if~~the system may be configured such that the answer phone setting time and the extension preset value which was stored in the non-volatile memory 102b can be changed by a user.

The answer phone message service center, which has received thea message reproduction instruction signal, sends a message signal to a calling terminal. The CPU of the calling terminal which received the message signal outputs the message signal to a telephone call speaker and so on, and informs atthe calling person of the message.

In addition, in the above-described embodiment, it was configured such that, after the message key 107a washas been depressed, in the state thata in which the portable telephone wasis opened, for example, as shown in Fig. 11(4), the telephone call start key was is depressed to start the telephone call (S1009), but since to depress

the message key 107a is also an indication of such an intention that at the user will answer the call later, to depress the telephone call start key again when the portable telephone is in the opened state becomes a double-duplicate troublesome task.

— In this connection, if the system may be configured such that, after the message key 107a was-is depressed in the closed state, if at the portable telephone is opened, at the telephone call is automatically started.

In this case On the other hand, if at the portable telephone is left in the opened state, the opened and closed state information which was stored in the volatile memory 102a is changed from the closed state "1" to the opened state "0", and the CPU 110 which recognizess that change, stops the sending of a response message, and activates the microphone 111 and the telephone call speaker 112, and carries out processing for restarting the telephone call state which was held in steps S1006.

By In this way, since a troublesome task the need for taking the trouble to depress the telephone call start key can be omitted, the usability is good.

Also, if the system maybe configured such that the telephone communication network, for example, the switching machine sends at the response message which was sent in step S1006. In this case, in the standby state (S1001) in which, an idle screen as, for example, as shown in Fig. 11(1),₁ is displayed, the switching machine C₁ which received (S1201) a calling signal which was sent from PORTABLE B₁ sends a ring signal for calling out PORTABLE A to PORTABLE A (S1202).

The CPU 110 of PORTABLE A, which received the ring signal, analyses at the telephone number and so on of PORTABLE B from the ring signal, and searches the address book data which was-is stored in the non-volatile memory 102b by use of using

the telephone number as a search key, and displays, for example, as shown in Fig. 11(2), name information which corresponds to the search key, on the sub display part 104, and so as to inform a the user that there is an incoming call (S1003). Here, in case that there is no name information which corresponds to the search key, in the address book data, the CPU 110 displays at the telephone number of the PORTABLE B.

In Fig. 11(2), the sub operation key 107a functions as a "MESSAGE" key, and the sub operation key 107b functions as a "CUT" key.

When a signal from this CUT key 107b is inputted to the CPU 110, CPU 110 sends a cut signal to the switching machine C through the communication part 101, and to reject reception, and it then returns to the standby state (S1001), and displays, for example, an idle screen, as shown in Fig. 11(1), on the sub display part 104 (S1004).

Also, when a signal from the message "MESSAGE" key 107a is inputted to the CPU 110 (S1005), the CPU 110 sends a response message start signal to the switching machine C through the communication part 101 (S1104)(S1203). Next, the switching machine C sends a response message of, for example, "Since I will answer soon, please hang on for awhile." and so on to PORTABLE B through the communication part 101 and the switching machine C (S1006) (S1204). At this time, in order to inform at the user of the sending of flowing a response message onto PORTABLE B, the CPU 110 displays, for example, a pop-up screen to that effect, as shown in Fig. 11(3), on the sub display part 104. At this time, communication may be or may not be established between PORTABLE A and PORTABLE B, but since a wireless resource is finite, the use efficiency of the wireless resource is better in case that communication is not established between PORTABLE A and PORTABLE B.

In Fig. 11(3), the sub operation key 107b functions as ~~the~~a cut key. When a signal from this cut key 107b is inputted to the CPU 110, the CPU 110 sends a cut signal to the switching machine C through the communication part 101, ~~and finishes to end~~ the sending of the response message from the switching machine C to PORTABLE B, and PORTABLE A returns to the standby state, and it then displays, for example, an idle screen, as shown in Fig. 11(1), on the sub display part 104 (S1007).

After the response message start signal was sent to the switching machine C (S1203), PORTABLE A is opened, and when the telephone call start key (Fig. 11(4)) of the main operation key 106 is depressed, a telephone call start instruction signal from the telephone call start key is inputted to the CPU 110 (S1008). At this time, the CPU 110 sends the telephone call start instruction signal to the switching machine C (S1205), ~~and establishes a communication connection with~~ PORTABLE B (S1206), and, at the same time, it activates the microphone 111 and a telephone call speaker 112, and sets to a state ~~that~~in which a telephone call is available (S1009)(S1207).

By the foregoing, since the switching machine is configured to send the response message, ~~the burdens of a providing memory space and processing of a in the portable telephone are for this purpose~~ is reduced.

As described above, mail reception and telephone call reception in the closed state was describedconsidered, but it is needless to say that at the key layout, at the display screen and so on are not limited to those described with reference to this embodiment. Also, as to at the point that a message is displayed at the time of mail reception, and on the basis of that message, browsing of the mails are is inquired, and as to a point that, on the basis of a result of that inquiry, a body text of a mail is

automatically displayed, it is needless to say that ~~they~~such features are applicable not only to a fold type portable telephone, but also to other types of portable telephone.

Also, in the embodiments which ~~were~~have been described so far, as a method ~~for~~of returning to a previous screen of the display screen which is being displayed on the sub display part 104, for example, the "RETURN" function was assigned to any one of the sub operation keys 107a and 107b, but ~~it~~the system may be configured such that a "RETURN" exclusive use operation key is separately disposed at a place where it can be operated even in a case of the state that ~~where~~the portable telephone ~~was~~is closed, and by depressing that key in case that it was depressed, if ~~the~~display returns to the previous screen.

Also, in the foregoing embodiments, as a display part, a liquid crystal panel ~~is~~has been considered, but ~~it~~the invention is not limited to this, and for example, ~~it~~may be a the display part which usedmay consist of a light emitting device, such as an organic EL and so on.

Also, the invention is not limited to the embodiments which were shown as described above, and a principle and a new characteristic which were disclosed here include a broad range of a technical scope.

A) As described above, according to this invention, ~~in a foldable~~when the portable telephone is in the folded state, the usability in a folded state can be improved. In particular, it is possible to improve the usability at the time of camera operation.

Also, according to another aspect of the invention, it is possible to prevent a wrong operation of an operation key which ~~was~~is formed on a back surface of the portable telephone.

Also, according to still another aspect of the invention, it is possible to prevent a malfunction of an operation key which ~~was-is~~ formed on a back surfaceof the portable telephone.